Space Weather Forecast

Issued on Sunday, 03 July 2022 at 13:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms throughout the forecast period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Very Low over the past 24 hours, with no significant flares observed. There are currently four active regions on the Earth-facing disc. A mature region in the southwest, is largely inactive and will rotate off the Earth-facing disc in the next 12-24 hours. A region in the northeast has developed a number of spots to the east of the main, larger spot and appears to be increasing in complexity. The remaining regions are all weak, benign or fading. No Earth-directed CMEs (Coronal Mass Ejections) have been observed on available imagery.

Solar Wind / Geomagnetic Activity: The solar wind speed, has been at background levels, generally varying between 300-330km/s, but with a recent increase to 330-350km/s. Total magnetic field strength was initially at moderate levels, decreasing to become weak between around 03/0000-0700 UTC before increasing again to become moderate. This is possibly attributable to the arrival of an expected slow CME. The important north-south component of the magnetic field was predominantly positive, varying between weak and moderate. A more prolonged period of moderately northward magnetic field was seen from around 03/0700 UTC. Geomagnetic activity was Quiet (Kp 0-2) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low or Very Low, with a very slight chance of Moderate activity.

Solar Wind / Geomagnetic Activity: Solar winds are currently at background speeds, however, the anticipated slow CME appears to have arrived at Earth today. Although Geomagnetic activity is currently Quiet, any more prolonged periods of southward directed magnetic field could see a slight chance of geomagnetic storms, given that the previous CME from 01 July may have primed the near earth environment. A further Earth-directed CME may arrive at the Earth either late on 05 or into 06 July (Day 3 or 4).

A fast solar wind may connect with the Earth on 04 July with elevated speeds although this low confidence, due to the relative positions of Earth and the feature on the solar disc. A further fast solar wind is then likely to connect with Earth on day 3 (05 July) with estimated speeds of 500km/s. There is a slight chance of G1/Minor Storms throughout much of the period, with a higher risk on day 3 due to the combination of the potential onset of the initiation of the fast solar wind and the possible CME arrival.

Energetic Particles / Solar Radiation: In the absence of any significant sunspot development, the count rate of energetic particles (high energy protons) is forecast to persist at background levels, with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	30	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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